SEQUENCE LISTING

<110> Thibeault, Diane
Lamarre, Daniel
Maurice, Roger
Pilote, Louise
Pause, Armin

<120> Purified Active HCV NS2/3 Protease

<130> 13/082-1-D1

<150> US 10/017,736
<151> 2001-12-14

<150> US 60/256,031
<151> 2000-12-15

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<170> FastSEQ for Windows Version 4.0

<210> 1
<211> 1230
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<220>
<221> CDS
<222> (1)...(1230)

<400> 1

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atg gac cgg gag atg gct gca tcg tgc gga ggc gcg gtt ttc ata ggt   48
Met Asp Arg Glu Met Ala Ala Ser Cys Gly Gly Ala Val Phe Ile Gly
 1               5                  10                  15

ctt gca ctc ttg acc ttg tca cca tac tat aaa gtg ctc ctc gct agg   96
Leu Ala Leu Leu Thr Leu Ser Pro Tyr Tyr Lys Val Leu Leu Ala Arg
            20                  25                  30

ctc ata tgg tgg tta cag tat tta atc acc aga gtc gag gcg cac ttg   144
Leu Ile Trp Trp Leu Gln Tyr Leu Ile Thr Arg Val Glu Ala His Leu
        35                  40                  45

caa gtg tgg atc ccc cct ctc aat gtt cgg gga ggc cgc gat gcc atc   192
Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Ile
    50                  55                  60

atc ctc ctc acg tgc gca gtc cac cca gag cta atc ttt gac atc acc   240
Ile Leu Leu Thr Cys Ala Val His Pro Glu Leu Ile Phe Asp Ile Thr
65                  70                  75                  80

aaa ctc ctg ctc gcc ata ttc ggt ccg ctc atg gtg ctc cag gca ggc   288
Lys Leu Leu Leu Ala Ile Phe Gly Pro Leu Met Val Leu Gln Ala Gly
                85                  90                  95

ata acc aaa gtg ccg tac ttc gtg cgt gcg cag ggg ctc att cgt gcg   336
Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile Arg Ala
```

```
            100                 105                 110

tgt atg ttg gtg cgg aag gct gcg ggg ggt cat tat gtc caa atg gcc   384
Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln Met Ala
        115                 120                 125

ttc atg aag cta gct gcg ctg aca ggt acg tac gtt tat gac cat ctc   432
Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu
    130                 135                 140

act cca ttg cag gat tgg gcc cac gcg ggc cta cga gac ctt gca gtg   480
Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val
145                 150                 155                 160

gcg gta gag ccc gtc atc ttc tct gac atg gag gtc aag atc atc acc   528
Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile Thr
                165                 170                 175

tgg ggg gcg gac acc gcg gca tgc ggg gac atc att tca ggt ctg ccc   576
Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu Pro
            180                 185                 190

gtc tcc gct cga agg gga agg gag ata ctc ctg gga ccg gcc gat aat   624
Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp Asn
        195                 200                 205

ttt gaa ggg cag ggg tgg cga ctc ctt gcg ccc atc acg gcc tac tcc   672
Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser
    210                 215                 220

caa cag aca cgg ggc cta ctt ggt tgc atc atc acc agc ctc aca ggc   720
Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly
225                 230                 235                 240

cgg gac aag aac cag gtc gag ggg gag gtt caa gtg gtc tcc acc gct   768
Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala
                245                 250                 255

aca caa tct ttc ctg gcg acc tgc gtc aac ggc gtg tgt tgg act gtc   816
Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val
            260                 265                 270

ttc cat ggc gcc ggc tca aag acc ttg gcc ggc ccc aaa ggc cca atc   864
Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile
        275                 280                 285

acc cag atg tac act aat gtg gac cag gac ctc gtc ggc tgg cag gcg   912
Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala
    290                 295                 300

ccc cct ggg gcg cgc tcc atg aca cca tgc acc tgc ggc agc tcg gac   960
Pro Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser Ser Asp
305                 310                 315                 320


ctc tat ttg gtc acg aga cat gcc gac gtc att ccg gtg cgc cgg cgg   1008
Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg
                325                 330                 335
```

```
ggc gac agt agg ggg agc ctg ctc tcc ccc agg cct gtc tcc tac ttg   1056 Gly
Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu
            340                 345                 350

aag ggc tct tcg ggt ggc cca ctg ctc tgc cct tcg ggg cac gct gtg   1104
Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val
        355                 360                 365

ggc atc ttc cgg gct gct gtg tgc acc cgg ggg gtt gca aaa gcg gtg   1152
Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val
    370                 375                 380

gac ttc ata cct gtt gag tct atg gaa act acc atg cgg act agt agc   1200
Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg Thr Ser Ser
385                 390                 395                 400

gct tgg cgt cac ccg cag ttc ggt ggt taa                          1230
Ala Trp Arg His Pro Gln Phe Gly Gly  *
                405
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<210> 2
<211> 409
<212> PRT
<213> HCV

<400> 2

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Met Asp Arg Glu Met Ala Ala Ser Cys Gly Gly Ala Val Phe Ile Gly
 1               5                  10                  15

Leu Ala Leu Leu Thr Leu Ser Pro Tyr Tyr Lys Val Leu Leu Ala Arg
            20                  25                  30

Leu Ile Trp Trp Leu Gln Tyr Leu Ile Thr Arg Val Glu Ala His Leu
        35                  40                  45

Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Ile
    50                  55                  60

Ile Leu Leu Thr Cys Ala Val His Pro Glu Leu Ile Phe Asp Ile Thr
65                  70                  75                  80

Lys Leu Leu Leu Ala Ile Phe Gly Pro Leu Met Val Leu Gln Ala Gly
                85                  90                  95

Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile Arg Ala
            100                 105                 110

Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln Met Ala
        115                 120                 125

Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu
    130                 135                 140

Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val
145                 150                 155                 160

Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile Thr
                165                 170                 175
```

```
Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu Pro
            180                 185                 190

Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp Asn
        195                 200                 205

Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser
    210                 215                 220

Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly
225                 230                 235                 240

Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala
                245                 250                 255

Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val
            260                 265                 270

Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile
        275                 280                 285

Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala
    290                 295                 300

Pro Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser Ser Asp
305                 310                 315                 320

Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg
                325                 330                 335

Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu
            340                 345                 350

Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val
        355                 360                 365

Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val
    370                 375                 380

Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg Thr Ser Ser
385                 390                 395                 400

Ala Trp Arg His Pro Gln Phe Gly Gly
                405
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<210> 3
<211> 1011
<212> DNA
<213> HCV

<220>
<221> CDS
<222> (1)...(1005)

<400> 3

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atg aaa aag aaa aag ctc gag cat cac cat cac cat cac act agt gca   48
Met Lys Lys Lys Lys Leu Glu His His His His His His Thr Ser Ala
 1               5                  10                  15
```

```
ggc ata acc aaa gtg ccg tac ttc gtg cgt gcg cag ggg ctc att cgt   96
Gly Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile Arg
            20                  25                  30

gcg tgt atg ttg gtg cgg aag gct gcg ggg ggt cat tat gtc caa atg   144
Ala Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln Met
        35                  40                  45

gcc ttc atg aag cta gct gcg ctg aca ggt acg tac gtt tat gac cat   192
Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His
    50                  55                  60

ctc act cca ttg cag gat tgg gcc cac gcg ggc cta cga gac ctt gca   240
Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala
65                  70                  75                  80

gtg gcg gta gag ccc gtc atc ttc tct gac atg gag gtc aag atc atc   288
Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile
                85                  90                  95

acc tgg ggg gcg gac acc gcg gca tgc ggg gac atc att tca ggt ctg   336
Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu
            100                 105                 110

ccc gtc tcc gct cga agg gga agg gag ata ctc ctg gga ccg gcc gat   384
Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp
        115                 120                 125

aat ttt gaa ggg cag ggg tgg cga ctc ctt gcg ccc atc acg gcc tac   432
Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr
    130                 135                 140

tcc caa cag aca cgg ggc cta ctt ggt tgc atc atc acc agc ctc aca   480
Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr
145                 150                 155                 160

ggc cgg gac aag aac cag gtc gag ggg gag gtt caa gtg gtc tcc acc   528
Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr
                165                 170                 175

gct aca caa tct ttc ctg gcg acc tgc gtc aac ggc gtg tgt tgg act   576
Ala Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr
            180                 185                 190

gtc ttc cat ggc gcc ggc tca aag acc ttg gcc ggc ccc aaa ggc cca   624
Val Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro
        195                 200                 205

atc acc cag atg tac act aat gtg gac cag gac ctc gtc ggc tgg cag   672
Ile Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln
    210                 215                 220

gcg ccc cct ggg gcg cgc tcc atg aca cca tgc acc tgc ggc agc tcg   720
Ala Pro Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser Ser
225                 230                 235                 240

gac ctc tat ttg gtc acg aga cat gcc gac gtc att ccg gtg cgc cgg   768
Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg
                245                 250                 255
```

```
cgg ggc gac agt agg ggg agc ctg ctc tcc ccc agg cct gtc tcc tac   816
Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr
            260                 265                 270

ttg aag ggc tct tcg ggt ggc cca ctg ctc tgc cct tcg ggg cac gct   864
Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala
        275                 280                 285

gtg ggc atc ttc cgg gct gct gtg tgc acc cgg ggg gtt gca aaa gcg   912
Val Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala
    290                 295                 300

gtg gac ttc ata cct gtt gag tct atg gaa act acc atg cgg act agt   960
Val Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg Thr Ser
305                 310                 315                 320

agc gct tgg cgt cac ccg cag ttc ggt ggt aaa aag aaa aag taa       1005
Ser Ala Trp Arg His Pro Gln Phe Gly Gly Lys Lys Lys Lys  *
                325                 330

ggatcc                                                           1011
```

<210> 4
<211> 334
<212> PRT
<213> HCV

<400> 4

```
Met Lys Lys Lys Lys Leu Glu His His His His His His Thr Ser Ala
 1               5                  10                  15

Gly Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile Arg
            20                  25                  30

Ala Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln Met
        35                  40                  45

Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His
    50                  55                  60

Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala
65                  70                  75                  80

Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile
                85                  90                  95

Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu
            100                 105                 110

Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp
        115                 120                 125

Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr
    130                 135                 140

Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr
145                 150                 155                 160

Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr
```

```
                165                 170                 175

Ala Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr
            180                 185                 190

Val Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro
        195                 200                 205

Ile Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln
    210                 215                 220

Ala Pro Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser Ser
225                 230                 235                 240

Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg
                245                 250                 255

Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr
            260                 265                 270

Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala
        275                 280                 285

Val Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala
    290                 295                 300

Val Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg Thr Ser
305                 310                 315                 320

Ser Ala Trp Arg His Pro Gln Phe Gly Gly Lys Lys Lys Lys
                325                 330
```

<210> 5
<211> 20
<212> DNA
<213> HCV

<400> 5
ccatggaccg ggagatggct 20

<210> 6
<211> 63
<212> DNA
<213> HCV

<400> 6
ggatccttaa ccaccgaact gcgggtgacg ccaagcgcta ctagtccgca tggtagtttc 60
cat 63

<210> 7
<211> 46
<212> DNA
<213> HCV

<400> 7
gctcgagcat caccatcacc atcacactag tgcaggcata accaaa 46

<210> 8
<211> 45
<212> DNA
<213> HCV

<400> 8
aacaatggat ccttactttt tctttttacc accgaactgc gggtg 45

<210> 9
<211> 45
<212> DNA
<213> HCV

<400> 9
acctgccata tgaaaaagaa aaagctcgag catcaccatc accat 45

<210> 10
<211> 303
<212> PRT
<213> HCV

<400> 10
Ala Gly Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile
 1   5   10   15

Arg Ala Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln
            20   25   30

Met Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp
        35   40   45

His Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu
    50   55   60

Ala Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile
65   70   75   80

Ile Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly
                85   90   95

Leu Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala
            100   105   110

Asp Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala
        115   120   125

Tyr Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu
    130   135   140

Thr Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser
145   150   155   160

Thr Ala Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp
                165   170   175

Thr Val Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly
            180   185   190

```
Pro Ile Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp
        195                 200                 205

Gln Ala Pro Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser
    210                 215                 220

Ser Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg
225                 230                 235                 240

Arg Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser
                245                 250                 255

Tyr Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His
            260                 265                 270

Ala Val Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys
        275                 280                 285

Ala Val Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg
    290                 295                 300
```

<210> 11
<211> 393
<212> PRT
<213> HCV

<400> 11

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Met Ala Ala Ser Cys Gly Gly Ala Val Phe Ile Gly Leu Ala Leu Leu
 1               5                  10                  15

Thr Leu Ser Pro Tyr Tyr Lys Val Leu Leu Ala Arg Leu Ile Trp Trp
            20                  25                  30

Leu Gln Tyr Leu Ile Thr Arg Val Glu Ala His Leu Gln Val Trp Ile
        35                  40                  45

Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Ile Ile Leu Leu Thr
    50                  55                  60

Cys Ala Val His Pro Glu Leu Ile Phe Asp Ile Thr Lys Leu Leu Leu
65                  70                  75                  80

Ala Ile Phe Gly Pro Leu Met Val Leu Gln Ala Gly Ile Thr Lys Val
                85                  90                  95

Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile Arg Ala Cys Met Leu Val
            100                 105                 110

Arg Lys Ala Ala Gly Gly His Tyr Val Gln Met Ala Phe Met Lys Leu
        115                 120                 125

Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu Thr Pro Leu Gln
    130                 135                 140

Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val Ala Val Glu Pro
145                 150                 155                 160

Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile Thr Trp Gly Ala Asp
```

```
                165                 170                 175

Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu Pro Val Ser Ala Arg
            180                 185                 190

Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp Asn Phe Glu Gly Gln
        195                 200                 205

Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser Gln Gln Thr Arg
    210                 215                 220

Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn
225                 230                 235                 240

Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala Thr Gln Ser Phe
                245                 250                 255

Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val Phe His Gly Ala
            260                 265                 270

Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile Thr Gln Met Tyr
        275                 280                 285

Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala Pro Pro Gly Ala
    290                 295                 300

Arg Ser Met Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val
305                 310                 315                 320

Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg Gly Asp Ser Arg
                325                 330                 335

Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu Lys Gly Ser Ser
            340                 345                 350

Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val Gly Ile Phe Arg
        355                 360                 365

Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile Pro
    370                 375                 380

Val Glu Ser Met Glu Thr Thr Met Arg
385                 390


<210> 12
<211> 380
<212> PRT
<213> HCV

<400> 12
Ala Leu Leu Thr Leu Ser Pro Tyr Tyr Lys Val Leu Leu Ala Arg Leu
 1               5                  10                  15

Ile Trp Trp Leu Gln Tyr Leu Ile Thr Arg Val Glu Ala His Leu Gln
            20                  25                  30

Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Ile Ile
        35                  40                  45
```

```
Leu Leu Thr Cys Ala Val His Pro Glu Leu Ile Phe Asp Ile Thr Lys
    50                  55                  60

Leu Leu Leu Ala Ile Phe Gly Pro Leu Met Val Leu Gln Ala Gly Ile
65                  70                  75                  80

Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile Arg Ala Cys
                85                  90                  95

Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln Met Ala Phe
            100                 105                 110

Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu Thr
        115                 120                 125

Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val Ala
    130                 135                 140

Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile Ile Thr Trp
145                 150                 155                 160

Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly Leu Pro Val
                165                 170                 175

Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala Asp Asn Phe
            180                 185                 190

Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser Gln
        195                 200                 205

Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly Arg
    210                 215                 220

Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala Thr
225                 230                 235                 240

Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val Phe
                245                 250                 255

His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile Thr
            260                 265                 270

Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala Pro
        275                 280                 285

Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser Ser Asp Leu
    290                 295                 300

Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg Gly
305                 310                 315                 320

Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu Lys
                325                 330                 335

Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val Gly
            340                 345                 350

Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val Asp
        355                 360                 365
```

```
Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg
    370                 375                 380


<210> 13
<211> 352
<212> PRT
<213> HCV

<400> 13
Ala His Leu Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg
 1               5                  10                  15

Asp Ala Ile Ile Leu Leu Thr Cys Ala Val His Pro Glu Leu Ile Phe
            20                  25                  30

Asp Ile Thr Lys Leu Leu Leu Ala Ile Phe Gly Pro Leu Met Val Leu
        35                  40                  45

Gln Ala Gly Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu
    50                  55                  60

Ile Arg Ala Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val
65                  70                  75                  80

Gln Met Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr
                85                  90                  95

Asp His Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp
            100                 105                 110

Leu Ala Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys
        115                 120                 125

Ile Ile Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser
    130                 135                 140

Gly Leu Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro
145                 150                 155                 160

Ala Asp Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr
                165                 170                 175

Ala Tyr Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser
            180                 185                 190

Leu Thr Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val
        195                 200                 205

Ser Thr Ala Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys
    210                 215                 220

Trp Thr Val Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys
225                 230                 235                 240

Gly Pro Ile Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly
                245                 250                 255

Trp Gln Ala Pro Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly
            260                 265                 270
```

```
Ser Ser Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val
        275                 280                 285

Arg Arg Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val
    290                 295                 300

Ser Tyr Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly
305                 310                 315                 320

His Ala Val Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala
                325                 330                 335

Lys Ala Val Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg
            340                 345                 350
```

<210> 14
<211> 341
<212> PRT
<213> HCV

<400> 14

```
Val Arg Gly Gly Arg Asp Ala Ile Ile Leu Leu Thr Cys Ala Val His
 1               5                  10                  15

Pro Glu Leu Ile Phe Asp Ile Thr Lys Leu Leu Leu Ala Ile Phe Gly
            20                  25                  30

Pro Leu Met Val Leu Gln Ala Gly Ile Thr Lys Val Pro Tyr Phe Val
        35                  40                  45

Arg Ala Gln Gly Leu Ile Arg Ala Cys Met Leu Val Arg Lys Ala Ala
    50                  55                  60

Gly Gly His Tyr Val Gln Met Ala Phe Met Lys Leu Ala Ala Leu Thr
65                  70                  75                  80

Gly Thr Tyr Val Tyr Asp His Leu Thr Pro Leu Gln Asp Trp Ala His
                85                  90                  95

Ala Gly Leu Arg Asp Leu Ala Val Ala Val Glu Pro Val Ile Phe Ser
            100                 105                 110

Asp Met Glu Val Lys Ile Ile Thr Trp Gly Ala Asp Thr Ala Ala Cys
        115                 120                 125

Gly Asp Ile Ile Ser Gly Leu Pro Val Ser Ala Arg Arg Gly Arg Glu
    130                 135                 140

Ile Leu Leu Gly Pro Ala Asp Asn Phe Glu Gly Gln Gly Trp Arg Leu
145                 150                 155                 160

Leu Ala Pro Ile Thr Ala Tyr Ser Gln Gln Thr Arg Gly Leu Leu Gly
                165                 170                 175

Cys Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn Gln Val Glu Gly
            180                 185                 190

Glu Val Gln Val Val Ser Thr Ala Thr Gln Ser Phe Leu Ala Thr Cys
```

```
        195                 200                 205

Val Asn Gly Val Cys Trp Thr Val Phe His Gly Ala Gly Ser Lys Thr
    210                 215                 220

Leu Ala Gly Pro Lys Gly Pro Ile Thr Gln Met Tyr Thr Asn Val Asp
225                 230                 235                 240

Gln Asp Leu Val Gly Trp Gln Ala Pro Pro Gly Ala Arg Ser Met Thr
                245                 250                 255

Pro Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr Arg His Ala
            260                 265                 270

Asp Val Ile Pro Val Arg Arg Arg Gly Asp Ser Arg Gly Ser Leu Leu
        275                 280                 285

Ser Pro Arg Pro Val Ser Tyr Leu Lys Gly Ser Ser Gly Gly Pro Leu
    290                 295                 300

Leu Cys Pro Ser Gly His Ala Val Gly Ile Phe Arg Ala Ala Val Cys
305                 310                 315                 320

Thr Arg Gly Val Ala Lys Ala Val Asp Phe Ile Pro Val Glu Ser Met
                325                 330                 335

Glu Thr Thr Met Arg
            340
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<210> 15
<211> 292
<212> PRT
<213> HCV

```
<400> 15
Ala Gln Gly Leu Ile Arg Ala Cys Met Leu Val Arg Lys Ala Ala Gly
 1               5                  10                  15

Gly His Tyr Val Gln Met Ala Phe Met Lys Leu Ala Ala Leu Thr Gly
            20                  25                  30

Thr Tyr Val Tyr Asp His Leu Thr Pro Leu Gln Asp Trp Ala His Ala
        35                  40                  45

Gly Leu Arg Asp Leu Ala Val Ala Val Glu Pro Val Ile Phe Ser Asp
    50                  55                  60

Met Glu Val Lys Ile Ile Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly
65                  70                  75                  80

Asp Ile Ile Ser Gly Leu Pro Val Ser Ala Arg Arg Gly Arg Glu Ile
                85                  90                  95

Leu Leu Gly Pro Ala Asp Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu
            100                 105                 110

Ala Pro Ile Thr Ala Tyr Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys
        115                 120                 125
```

```
Ile Ile Thr Ser Leu Thr Gly Arg Asp Lys Asn Gln Val Glu Gly Glu
    130                 135                 140

Val Gln Val Val Ser Thr Ala Thr Gln Ser Phe Leu Ala Thr Cys Val
145                 150                 155                 160

Asn Gly Val Cys Trp Thr Val Phe His Gly Ala Gly Ser Lys Thr Leu
                165                 170                 175

Ala Gly Pro Lys Gly Pro Ile Thr Gln Met Tyr Thr Asn Val Asp Gln
            180                 185                 190

Asp Leu Val Gly Trp Gln Ala Pro Pro Gly Ala Arg Ser Met Thr Pro
        195                 200                 205

Cys Thr Cys Gly Ser Ser Asp Leu Tyr Leu Val Thr Arg His Ala Asp
    210                 215                 220

Val Ile Pro Val Arg Arg Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser
225                 230                 235                 240

Pro Arg Pro Val Ser Tyr Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu
                245                 250                 255

Cys Pro Ser Gly His Ala Val Gly Ile Phe Arg Ala Ala Val Cys Thr
            260                 265                 270

Arg Gly Val Ala Lys Ala Val Asp Phe Ile Pro Val Glu Ser Met Glu
        275                 280                 285

Thr Thr Met Arg
    290
```

<210> 16
<211> 303
<212> PRT
<213> HCV

<400> 16

```
Ala Gly Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile
 1               5                  10                  15

Arg Ala Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln
            20                  25                  30

Met Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp
        35                  40                  45

Ala Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu
    50                  55                  60

Ala Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile
65                  70                  75                  80

Ile Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly
                85                  90                  95

Leu Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala
            100                 105                 110
```

```
Asp Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala
        115                 120                 125

Tyr Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu
    130                 135                 140

Thr Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser
145                 150                 155                 160

Thr Ala Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp
                165                 170                 175

Thr Val Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly
            180                 185                 190

Pro Ile Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp
        195                 200                 205

Gln Ala Pro Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser
    210                 215                 220

Ser Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg
225                 230                 235                 240

Arg Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser
                245                 250                 255

Tyr Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His
            260                 265                 270

Ala Val Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys
        275                 280                 285

Ala Val Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg
    290                 295                 300
```

<210> 17
<211> 301
<212> PRT
<213> HCV

<400> 17

```
Ala Gly Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile
 1               5                  10                  15

Arg Ala Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln
            20                  25                  30

Met Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp
        35                  40                  45

His Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu
    50                  55                  60

Ala Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile
65                  70                  75                  80

Ile Thr Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Ser Gly
```

```
                85                  90                  95

Leu Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala
            100                 105                 110

Asp Asn Phe Glu Gly Gln Gly Trp Arg Leu Pro Ile Thr Ala Tyr Ser
        115                 120                 125

Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly
    130                 135                 140

Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala
145                 150                 155                 160

Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val
                165                 170                 175

Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile
            180                 185                 190

Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala
        195                 200                 205

Pro Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser Ser Asp
    210                 215                 220

Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg
225                 230                 235                 240

Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu
                245                 250                 255

Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val
            260                 265                 270

Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val
        275                 280                 285

Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg
    290                 295                 300
```

<210> 18
<211> 303
<212> PRT
<213> HCV

<400> 18

```
Ala Gly Ile Thr Lys Val Pro Tyr Phe Val Arg Ala Gln Gly Leu Ile
 1               5                  10                  15

Arg Ala Cys Met Leu Val Arg Lys Ala Ala Gly Gly His Tyr Val Gln
            20                  25                  30

Met Ala Phe Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp
        35                  40                  45

His Leu Thr Pro Leu Gln Asp Trp Ala His Ala Gly Leu Arg Asp Leu
    50                  55                  60
```

```
Ala Val Ala Val Glu Pro Val Ile Phe Ser Asp Met Glu Val Lys Ile
65                  70                  75                  80

Ile Thr Trp Gly Ala Asp Thr Ala Ala Ala Gly Asp Ile Ile Ser Gly
                85                  90                  95

Leu Pro Val Ser Ala Arg Arg Gly Arg Glu Ile Leu Leu Gly Pro Ala
            100                 105                 110

Asp Asn Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala
        115                 120                 125

Tyr Ser Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu
    130                 135                 140

Thr Gly Arg Asp Lys Asn Gln Val Glu Gly Glu Val Gln Val Val Ser
145                 150                 155                 160

Thr Ala Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp
                165                 170                 175

Thr Val Phe His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly
            180                 185                 190

Pro Ile Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp
        195                 200                 205

Gln Ala Pro Pro Gly Ala Arg Ser Met Thr Pro Cys Thr Cys Gly Ser
    210                 215                 220

Ser Asp Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg
225                 230                 235                 240

Arg Arg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser
                245                 250                 255

Tyr Leu Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His
            260                 265                 270

Ala Val Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys
        275                 280                 285

Ala Val Asp Phe Ile Pro Val Glu Ser Met Glu Thr Thr Met Arg
    290                 295                 300


<210> 19
<211> 11
<212> PRT
<213> HCV

<220>
<221> VARIANT
<222> (1)...(1)
<223> Asp labeled with anthranilyl

<221> VARIANT
<222> (6)...(6)
<223> Xaa at position 6 is Abu
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<221> VARIANT
<222> (6)...(7)
<223> Abu-A between 6 and 7 is C(O)-O
<221> VARIANT
<222> (9)...(9)
<223> Tyr at position 9 is derivatized with 3-NO2

<400> 19
Asp Asp Ile Val Pro Xaa Ala Met Tyr Thr Trp
 1   5   10

<210> 20
<211> 6
<212> PRT
<213> HCV

<220>
<221> VARIANT
<222> (1)...(1)
<223> Asp labeled with anthranilyl

<221> VARIANT
<222> (6)...(6)
<223> Xaa at position 6 is Abu

<400> 20
Asp Asp Ile Val Pro Xaa
 1   5

<210> 21
<211> 10
<212> PRT
<213> HCV

<400> 21
Ser Phe Glu Gly Gln Gly Trp Arg Leu Leu
 1   5   10

<210> 22
<211> 20
<212> PRT
<213> HCV

<400> 22
Ser Phe Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr
 1   5   10   15

Ser Gln Gln Thr
            20

<210> 23
<211> 10
<212> PRT
<213> HCV

<400> 23

Ala Pro Ile Thr Ala Tyr Ser Gln Gln Thr
1 5 10

<210> 24
<211> 12
<212> PRT
<213> HCV

<400> 24
Lys Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr
1 5 10

<210> 25
<211> 6
<212> PRT
<213> HCV

<400> 25
Ala Pro Ile Thr Ala Tyr
1 5